UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

September 19, 2011

Mr. Thomas Lynch
Acting Site Vice President Nine Mile Point
Nine Mile Point Nuclear Station, LLC
P.O. Box 63
Lycoming, NY 13093

SUBJECT: NINE MILE POINT NUCLEAR STATION - NRC COMPONENT DESIGN BASES INSPECTION REPORT 05000220/2011007 AND 05000410/2011007

Dear Mr. Lynch:

On August 5, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Nine Mile Point Nuclear Station, Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on August 5, 2011, with you and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. In conducting the inspection, the team examined the adequacy of selected components to mitigate postulated transients, initiating events, and design basis accidents. The inspection involved field walkdowns, examination of selected procedures, calculations and records, and interviews with station personnel.

Based on the results of this inspection, no findings were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for the public inspection in the NRC Public Docket Room or from the Publicly Available Records component of NRC's document system, Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

Lawrence T. Doerflein, Chief
Engineering Branch 2
Division of Reactor Safety

Mr. Thomas Lynch
Acting Site Vice President Nine Mile Point
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Sincerely,

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Lawrence T. Doerflein, Chief
Engineering Branch 2
Division of Reactor Safety

Distribution: See Next Page

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Docket Nos.: 50-220, 50-410
License Nos.: DPR-63, NPF-69

Enclosure:
Inspection Report 05000220/2011007 and 05000410/2011007
w/Attachment: Supplemental Information

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REGION I

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|---|---|
| Docket No: | 50-220, 50-410 |
| License No: | DPR-63, NPF-69 |
| Report No: | 05000220/2011007; 05000410/2011007 |
| Licensee: | Nine Mile Point Nuclear Station, LLC (NMPNS) |
| Facility: | Nine Mile Point, Units 1 and 2 |
| Location: | Oswego, NY |
| Inspection Period: | July 11 through August 5, 2011 |
| Inspectors: | F. Arner, Senior Reactor Inspector, Division of Reactor Safety (DRS), Team Leader<br>L. Scholl, Senior Reactor Inspector, DRS<br>C. Williams, Reactor Inspector, DRS<br>M. Orr, Reactor Inspector, DRS<br>D. Kern, Senior Reactor Inspector, DRS<br>T. Tinkel, NRC Mechanical Contractor<br>J. Leivo, NRC Electrical Contractor |
| Approved By: | Lawrence T. Doerflein, Chief<br>Engineering Branch 2<br>Division of Reactor Safety |

## SUMMARY OF FINDINGS

IR 05000220/2011007 and 05000410/2011007; 07/11/2011 - 08/5/2011; Nine Mile Point Nuclear Station, Units 1 and 2; Component Design Bases Inspection.

The report covers the Component Design Bases Inspection conducted by a team of five NRC inspectors and two NRC contractors. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

No findings were identified.

REPORT DETAILS

## 1. REACTOR SAFETY

### Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R21 Component Design Bases Inspection (IP 71111.21)

.1 Inspection Sample Selection Process

The team selected risk significant components for review using information contained in the Nine Mile Point Probabilistic Risk Assessment (PRA) and the U.S. Nuclear Regulatory Commission's (NRC) Standardized Plant Analysis Risk (SPAR) model for the Nine Mile Point (NMP) Nuclear Power Station. Additionally, the team referenced the Risk-Informed Inspection Notebook for the Nine Mile Point Nuclear Power Station (Revision 2.1a) in the selection of potential components for review. In general, the selection process focused on components that had a Risk Achievement Worth (RAW) factor greater than 1.3 or a Risk Reduction Worth (RRW) factor greater than 1.005. The components selected were associated with both safety-related and non-safety related systems, and included a variety of components such as pumps, breakers, transformers, switches, batteries, and valves.

The team initially compiled a list of components based on the risk factors previously mentioned. Additionally, the team reviewed the previous component design bases inspection (CDBI) reports (05000220 & 410/2006008 and 05000220 & 410/2008008) and excluded the majority of those components previously inspected. The team then performed a margin assessment to narrow the focus of the inspection to 21 components and four operating experience (OE) items. The team selected a Unit 1 main steam isolation valve and a Unit 2 drywell purge exhaust isolation valve to review, in part, for their containment isolation capability for large early release frequency (LERF) implications. The team's evaluation of possible low design margin included consideration of original design issues, margin reductions due to modifications, or margin reductions identified as a result of material condition/equipment reliability issues. The assessment also included items such as failed performance test results, corrective action history, repeated maintenance, Maintenance Rule (a)(1) status, operability reviews for degraded conditions, NRC resident inspector insights, system health reports, and industry OE. Finally, consideration was also given to the uniqueness and complexity of the design and the available defense-in-depth margins.

The inspection performed by the team was conducted as outlined in NRC Inspection Procedure (IP) 71111.21. This inspection effort included walkdowns of selected components; interviews with operators, system engineers, and design engineers; and reviews of associated design documents and calculations to assess the adequacy of the components to meet design basis, licensing basis, and risk-informed beyond design basis requirements. Summaries of the reviews performed for each component and OE sample are discussed in the subsequent sections of this report. Documents reviewed for this inspection are listed in the Attachment.

.2 Results of Detailed Reviews

.2.1 Results of Detailed Component Reviews (21 samples)

.2.1.1 Unit 1 125 Vdc Battery, 12

a. Inspection Scope

The team inspected the design, testing, and operation of the 125 Vdc Battery 12 on Unit 1 to verify it could perform its design basis function to provide direct current (DC) power to connected loads during normal, transient, and postulated accident conditions, including station blackout and post-fire safe shutdown events. Specifically, the team reviewed design calculations, including battery sizing and voltage drop calculations, load profile studies, and battery terminal connection resistances to evaluate whether the battery capacity was adequate for the equipment load and duration required by design and licensing bases conditions. The team reviewed battery calculations to determine whether adequate voltage was available to meet minimum voltage specifications for connected loads during worst case loading conditions. The team reviewed the battery hydrogen generation analysis and battery room ventilation design to determine whether hydrogen concentration levels would remain below acceptable levels during normal and postulated accident conditions.

The team also reviewed the recently performed battery discharge test and routine surveillance tests to assess whether the testing and maintenance was sufficient and performed in accordance with approved procedures, vendor recommendations, industry standards, and design and licensing bases requirements. The team interviewed design and system engineers regarding the design, operation, testing, and maintenance of the battery. The team interviewed and performed in-plant walkdowns with licensed operators to verify operator actions could be successfully accomplished as assumed in the NMP Unit 1 design basis calculations for loss-of-offsite power and station blackout events. The review included an assessment of environmental conditions and operator accessibility to the area, procedural guidance, operator training, availability of support equipment and tools, and the ability to recover from credible human performance errors during the manual operators actions. Finally, the team reviewed corrective action documents to ensure adverse conditions were being properly evaluated and corrected.

b. Findings

No findings were identified.

.2.1.2 Unit 1 Emergency Diesel Generator (EDG) 102 and Unit 2 Division I EDG, 2EGS*EG1 - Electrical Review (2 samples)

a. Inspection Scope

The team inspected the 102 EDG on Unit 1 and 2EGS*EG1 EDG on Unit 2 to confirm they were capable of meeting their design basis accident load requirements. The team reviewed the Updated Final Safety Analysis Report (UFSAR), station single line

diagrams, EDG rating documentation, station operating procedures, preventive and predictive maintenance activities, and completed surveillance tests to ensure consistency between the licensing and design bases, EDG field condition, and operating/test procedures. The surveillance tests were reviewed to ensure EDG load capability was demonstrated and in accordance with the maximum loading expected during accident conditions. The team reviewed the basis for brake horsepower assumptions for selected pump motors to ensure the diesel loading calculations considered bounding case motor load conditions. The team also confirmed that the loading calculations included an evaluation of additional load that could occur when engine speed was slightly higher than nominal (i.e. generator output greater than 60 Hz).

The team performed walkdowns of the EDGs to assess the adequacy of configuration control, the generator's operating environment, and the material condition of the EDG and support systems. The team reviewed corrective action documents and system health reports to determine if there were any adverse trends or significant open corrective actions associated with the EDG and to ensure causal evaluations and corrective actions for selected issues were appropriate and that corrective actions were taken to ensure reliable operation.

b. Findings

No findings were identified.

.2.1.3 Unit 1 Emergency Diesel Generator (EDG) 102 and Unit 2 Division I EDG, 2EGS*EG1 – Mechanical Review (2 samples)

a. Inspection Scope

The team inspected the 102 EDG and the 2EGS*EG1 EDG mechanical systems to verify they were capable of responding to design basis events. Specifically, the team reviewed the associated fuel oil, lube oil, starting air, intake, exhaust, and jacket water cooling systems to ensure they could adequately support the EDG accident load requirements. The team reviewed the UFSAR and Technical Specifications (TS) to gain an overall understanding of the design bases and operational requirements for the engine and mechanical support systems. Design calculations and procedures were reviewed to verify they were consistent with design bases requirements and design assumptions. This included a review of the respective EDG fuel oil consumption to ensure TS requirements were met under design basis maximum loading conditions. The team reviewed the design specifications for the starting air systems, air compressor actuation setpoints and TS limits for operability to verify that the air start systems were properly sized and could meet their design functions for successive starts.

The team conducted component walkdowns to verify that the installed configurations would support their design bases function under accident conditions, and had been maintained consistent with design assumptions. Surveillance test procedures and results were reviewed against the design bases requirements to verify that acceptance criteria for tested parameters were supported by calculations or other engineering documents in order to ensure component operation during design basis accident conditions. Finally,

the team reviewed system health reports, the preventive and corrective maintenance history, and corrective action system documents to determine if potential degradation was being properly monitored or prevented, and that component rework and replacement were consistent with equipment qualification life.

b. Findings

No findings were identified.

.2.1.4 Unit 1 600 Volt Motor Control Center (MCC), 171B

a. Inspection Scope

The team inspected the Unit 1 safety-related 600 Vac MCC 171B to confirm that it was capable of meeting its design basis requirements. MCC-171B was designed to provide a source of electrical power and control power for safety-related components in various systems. The MCC is energized from 600 Vac power board 17 which receives power from 4160 Vac power board 103. Power board 103 is normally energized from offsite power, and in the event of a loss-of-offsite power it is energized from EDG 103. As a result, MCC-171B will be energized during all normal, transient, and accident conditions. Electrical loads supplied by MCC-171B include numerous motor operated valves, ventilation fans, the EDG raw water cooling pumps, and air compressors.

The team reviewed design basis electrical calculations to ensure voltage provided at the load terminals was appropriate, (i.e. between the minimum required for operation and below the maximum at which damage could occur due to an overvoltage condition). The team also reviewed preventive and maintenance tasks to assess the adequacy of these activities in ensuring reliable operation. The team reviewed operating procedures and performed walk downs of the MCC to independently assess the configuration control, the operating environment, and its material condition. Finally, the team reviewed corrective action documents and system health reports to determine if there were any adverse trends associated with the MCC and to evaluate the significance of open corrective actions.

b. Findings

No findings were identified.

.2.1.5 Unit 1 Reserve Transformer, 101N

a. Inspection Scope

The team inspected the Unit 1 reserve transformer 101N to confirm that it was capable of meeting its design basis requirements. The transformer was designed to provide power from the 115 kV reserve bus to safety-related 4160 Vac power board 102 during normal operation, and during design basis transient and accident conditions. The team reviewed the alternating current (AC) system load flow and short circuit current calculations to determine the capability of the transformer to provide the maximum load at acceptable

voltage levels and to withstand potential short circuit conditions. The team also reviewed calculations associated with establishing the required operating voltage levels at the high side (115 kV) of the transformer, as well as establishing the set point for the tap changer that controls the low side (4160 Vac) output voltage to safety-related power board 102. In addition, the team reviewed the operating procedures to ensure the proper voltage levels were included and clearly delineated operating voltage levels under all conditions (e.g., tap changer in manual vs. automatic control).

The team reviewed preventive and predictive maintenance activities, and their results, to assess the adequacy of the licensee's programs in maintaining the transformer consistent with design assumptions. Doble test results of the transformer and bushings and the results of oil analyses were reviewed to ensure abnormal conditions were appropriately evaluated and dispositioned. The team performed a walkdown of the transformer to independently assess the configuration control, the operating environment, and its material condition. Finally, the team reviewed corrective action documents and system health reports to determine if there were any adverse trends associated with the transformer and to assess the effectiveness of issue evaluation and correction.

b. Findings

No findings were identified.

.2.1.6 Unit 2 Drywell Purge Exhaust Inboard Isolation Valve, 2CPS*AOV109

a. Inspection Scope

The team inspected the Unit 2 drywell purge exhaust inboard isolation valve to verify that the valve was capable of performing its design basis and risk significant functions. Valve 2CPS*AOV109 is a normally closed, air operated valve (AOV) and has a safety function to close for primary containment isolation, and a risk significant function to open for primary containment pressure control and purging in the emergency operating procedures (EOPs).

The team reviewed piping and instrumentation diagrams (P&ID), component and system design calculations, thrust and torque margin, and valve and actuator design specifications to assess the component's ability to fulfill its design functions under maximum postulated differential pressure during design basis conditions. The team assessed in-service testing (IST), containment leakage testing, and diagnostic testing results to ensure the valve was capable of operating in both the close and open direction under design basis conditions. The team conducted detailed system walkdowns of accessible support components to assess their material condition and to ensure the system configuration was consistent with drawings and the design and licensing bases. The team also discussed AOV performance, preventive maintenance (PM), and trending with the AOV engineer and design engineers to ensure that the AOV would function as designed. The team reviewed the maintenance history of the valve and support systems by sampling condition reports (CRs), work orders (WOs), and system health reports to

ensure there were no adverse trends and to assess Constellation's ability to identify, evaluate, and correct problems.

b. Findings

No findings were identified.

.2.1.7 Unit 2 Service Water Pump, 2SWP*P1B

a. Inspection Scope

The team inspected the Unit 2 service water (SW) pump, 2SWP*P1B, to verify that the pump was capable of performing its design basis function. The pump has a safety related function to provide an adequate supply of cooling water flow to safety related components during normal operation, and during and following a design basis loss-of-coolant accident (LOCA). In addition to the design basis function, the pump can be used to supply the residual heat removal (RHR) system via system intertie piping to allow flooding the containment as directed by EOPs.

The team reviewed the SW pump net positive suction head (NPSH) requirements and available NPSH to ensure the pump was capable of fulfilling its safety function at the maximum flowrates assumed and lowest intake levels. The team assessed the system hydraulic calculations under normal, transient, and LOCA conditions to ensure the pump provided adequate cooling to safety-related components and that design requirements for flow and pressure were properly translated into IST acceptance criteria. The team evaluated pump performance to ensure there was no degradation by reviewing IST results and post-maintenance testing results following pump replacement. The team conducted a detailed walkdown of the pump and SW bay to assess the material and environmental conditions, and to verify that the installed configuration was consistent with system drawings, and the design and licensing bases. Additionally, the team discussed the SW pump design, operation, and performance with the engineering staff, and reviewed operator logs to evaluate pump performance. The team reviewed the maintenance history of the pump and system by sampling CRs, WOs, and system health reports to ensure there were no adverse trends and to assess Constellation's ability to identify, evaluate, and correct problems.

b. Findings

No findings were identified.

.2.1.8 Unit 1 Containment Spray to Torus Flow Control Valve, FCV-80-118

a. Inspection Scope

The team inspected the Unit 1 containment spray to torus flow control valve, FCV 80-118, to verify that the valve was capable of performing its design basis functions. The valve is normally closed and has a safety-related function to open to remove heat

from the torus following a LOCA. The motor operated valve (MOV) can be manually closed remotely to provide containment isolation.

The team reviewed design calculations including required thrust, degraded voltage, maximum differential pressure, and actuator capability to verify that the valve would operate as required. The team reviewed periodic verification diagnostic test and stroke test data to verify acceptance criteria were met and ensure there were no adverse performance trends. The team verified that the MOV safety functions, switch settings, performance capability, and design margins were adequately monitored and maintained. The team verified that testing results were used to trend stem nut wear to ensure an adequate stem nut replacement frequency, and verified that maintenance procedures periodically lubricated valve components. The team reviewed the MOV weak link calculation to ensure the ability of the MOV to remain structurally functional while stroking under design basis conditions. The team conducted a walkdown of FCV 80-118 to assess the material condition and to verify the installed configuration was consistent with plant drawings, and the design and licensing bases. Finally, the team reviewed corrective action documents, system health reports, and work orders to determine if there were any adverse trends associated with the valve and to assess Constellation's capability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.9 Unit 2 Standby Liquid Control System Pump, 2SLS*P1A

a. Inspection Scope

The team inspected the Unit 2 standby liquid control system (SLCS) pump, 2SLS*P1A, to verify that the pump was capable of performing its design basis function. The pump has a safety-related function to inject boron solution for reactivity control in the event sufficient control rods do not insert when required.

The team reviewed SLCS pump NPSH requirements and available NPSH to ensure the pump was capable of fulfilling its safety function. The team assessed the system hydraulic calculations to ensure that the pump discharge relief valve setpoint was not challenged during the design pump flowrate, maximum assumed reactor backpressure, and maximum system friction losses during an anticipated transient without scram (ATWS). The team reviewed system modifications, post-maintenance testing, and IST results to ensure pump performance and margins were not degraded. The team conducted a detailed walkdown of the SLCS pump and system to assess the material condition and ensure the installed configuration was consistent with plant drawings and the design and licensing bases. The team discussed the pump's performance, adequacy of maintenance, modifications, and testing with engineering staff to evaluate overall component health. The team reviewed corrective action documents, system health reports, and WOs to determine if there were any adverse trends associated with the pump and to assess Constellation's capability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.10 Unit 2 125 Vdc Battery, 2BYS*BAT2A

a. Inspection Scope

The team inspected the design, testing, and operation of the 125 Vdc Battery 2BYS*BAT2A on Unit 2 to verify it could perform its design basis function to provide direct current (DC) power to connected loads during normal, transient, and postulated accident conditions, including a postulated station blackout (SBO) event. Specifically, the team reviewed design calculations, including battery sizing and voltage drop calculations, load profile studies, and battery terminal connection resistances to evaluate whether the battery capacity was adequate for the equipment load and duration required by design and licensing bases conditions. The team reviewed battery calculations to determine whether adequate voltage was available to meet minimum voltage specifications for connected loads during worst case loading conditions.

The team reviewed a sample of battery tests, including modified performance and service discharge tests, and weekly/quarterly surveillance tests to verify that testing and maintenance was sufficient and performed in accordance with approved procedures, industry standards, and design and licensing bases requirements. The team compared the test load profiles to the load profile studies for the LOCA with concurrent loss-of-offsite-power (LOOP) and the SBO design assumptions to verify the load testing enveloped the predicted worst case loading conditions. The team interviewed design and system engineers regarding the design, operation, testing, and maintenance of the battery. The team performed field walkdowns of the battery to independently assess the material condition of the battery cells and associated electrical equipment. The team reviewed and performed a walk down of selected portions of the SBO procedures to assess whether manual load shedding actions assumed in the calculations were correctly translated to the procedures and to ensure calculation assumptions were consistent with as-found circuit breaker configurations. Finally, the team reviewed system health reports and corrective action documents to determine if there were any adverse trends associated with the battery and to assess Constellation's capability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.11 Unit 2 125 Vdc Battery Charger, 2BYS*CHGR2C1

a. Inspection Scope

The team inspected the design, testing, and operation of the 125 Vdc battery charger 2BYS*CHGR2C1 on Unit 2 to verify that it could perform its design basis function to provide DC power to connected loads during normal, transient, and postulated accident

conditions. The team reviewed design calculations, drawings, and vendor specifications for battery charger sizing and load profile studies to evaluate its capability. The team reviewed maintenance and test procedures to determine whether they were adequate to ensure reliable operation and they were performed in accordance with licensing basis requirements, industry standards, and vendor recommendations. The team compared as-found and as-left inspection and test results to established acceptance criteria to verify the charger's capability conformed to design basis requirements.

The team interviewed system and design engineers and walked down the battery chargers to independently assess the material condition and to verify that the system alignment and operating environment were consistent with design assumptions. Finally, the team reviewed corrective action documents and system health reports to determine if there were any adverse trends associated with the charger and to assess Constellation's capability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.12 Unit 2 Main Steam Lead Temperature Steam Line Isolation Instrumentation, 2MSS*TE50A through 2MSS*TE50D and 2MSS*TE69A through 2MSS*TE69D

a. Inspection Scope

The team inspected the temperature instrument channels for 2MSS*TE50A through 2MSS*TE50D, and 2MSS*TE69A through 2MSS*TE69D, to confirm they were capable of meeting design basis requirements while maintaining sufficient operating margins. The temperature instrumentation was designed to detect a main steam line break and initiate automatic isolation of the main steam isolation valves (MSIVs). A focus of the team's review was on the potential for the instrumentation to inadvertently cause an initiating event through an inadvertent MSIV isolation signal that would challenge the reactor protection system. The team reviewed assumptions, design inputs, and methodology for calculations and identified key vendor inputs that had established the basis for process safety limits, setpoints, and operational limits.

The team reviewed the evaluation of the impact of the extended power uprate (EPU) on the setpoints and ambient temperatures to verify that margin would be maintained. The team walked down accessible instrumentation, including temperature switch modules and displays in the control room, to assess configuration control, operating environment, and the material condition. For inaccessible instrumentation, the team reviewed the installation details and plant layout drawings to ensure they were consistent with configurations assumed in the associated calculations. The team also reviewed ambient temperature logs to ensure operating margins were adequate under elevated ambient temperature conditions. The team reviewed the evaluation for the scheduled replacement of the existing analog switch modules with digital modules to assess conformance to design basis requirements for independence and isolation, as well as qualification requirements for the digital upgrade. Finally, the team reviewed a sample of completed surveillance tests, corrective action documents, and system health reports to

determine if any adverse trends existed and to assess Constellation's capability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.13 Unit 1 Main Steam Isolation Valve, IV-01-01

a. Inspection Scope

The team inspected Unit 1 MSIV IV-01-01 to verify the valve was capable of performing its design basis function to close on various isolation instrumentation signals. The team reviewed the UFSAR, system design basis documents (SDBD), and drawings to identify the design basis requirements for the MOV. The team reviewed design standards and operating procedures to determine whether criteria established for evaluating the potential for pressure locking of the MOV were appropriate. The team reviewed calculations for valve stem thrust, MOV actuator inputs, and weak link analysis to ensure that the MOV was capable of operation under the worst-case line pressure and differential pressure conditions.

The team reviewed surveillance test procedures to verify that design basis stroke times were enveloped by test acceptance criteria, and that the leak rate through the valve when isolated was consistent with 10 CFR 50 Appendix J requirements. The team reviewed vendor manuals to ensure recommended maintenance had been established through the preventive maintenance program. The team interviewed the system engineer to determine whether surveillance test data was appropriately trended and evaluated for indications of potential component degradation such as stem nut wear. Work orders were reviewed to verify that qualified replacement parts were installed and to confirm that lubrication maintenance was being implemented in accordance with station procedures. The team reviewed the modification to replace the limit switches on the valve to ensure the change was implemented in accordance with the design package. Finally, the team reviewed condition reports to identify failures or adverse conditions, and to determine whether issues were being identified and properly addressed.

b. Findings

No findings were identified.

.2.1.14 Unit 1 Reactor Building Closed Loop Cooling (RBCLC) Pump, PMP-70-02

a. Inspection Scope

The team inspected the Unit 1 RBCLC pump, PMP-70-02, to verify that the pump was capable of performing its design basis function of providing an intermediate cooling loop between reactor systems and the service water system. The team reviewed applicable portions of the UFSAR, TSs, SDBDs, calculations, and procedures to identify the pump design basis requirements. The team reviewed recent RBCLC pump test results and

trends in test data to verify that pump performance remained consistent with design basis requirements. The team reviewed calculations to ensure design requirements for flow and pressure were appropriately translated into acceptance criteria in pump IST procedures. The team verified that adequate NPSH was available for the RBCLC pump, which included worst case maximum flow conditions expected within the system.

The team reviewed completed surveillance tests for pump motor running current to determine if the results were consistent with specified test acceptance criterion and EDG load assumptions. Data for motor running current was also reviewed to verify pump motor performance was being monitored for signs of degradation. The plant equipment lubrication specification and PM optimization strategies were reviewed to determine the requirements for sampling, analyzing, and changing bearing lubricating oil. The team reviewed completed work orders to verify that required lubrication was being performed. The team reviewed a modification to upgrade shaft mechanical seals to ensure the change met design and performance requirements. The team also conducted walkdowns of the pump to assess the material condition and to verify the installed configuration was consistent with plant drawings and the design and licensing bases. Finally, the team reviewed corrective action documents, system health reports, and WOs to determine if there were any adverse trends associated with the pump and to assess Constellation's problem identification, evaluation, and resolution of issues.

b. Findings

No findings were identified.

.2.1.15 Unit 1 Core Spray Pump, PMP-81-24

a. Inspection Scope

The team inspected the Unit 1 core spray pump, PMP-81-24, to verify that the pump was capable of performing its design basis function of providing sufficient cooling to the core in response to a postulated LOCA condition. The team reviewed applicable portions of the UFSAR, TSs, SDBDs, calculations, and procedures to identify the pump design basis requirements. The team reviewed recent pump test results to verify that pump performance remained consistent with design basis requirements. The team reviewed calculations to ensure design requirements for flow and pressure were appropriately translated into acceptance criteria in pump IST procedures. The team verified that adequate NPSH was available for the core spray pump, which included worst case maximum flow conditions expected within the system.

The team reviewed completed surveillance tests for pump motor running current to determine if the results were consistent with specified test acceptance criterion. The plant equipment lubrication specification and PM optimization strategies were reviewed to determine the requirements for sampling, analyzing, and changing bearing lubricating oil. The team reviewed completed work orders to verify that required lubrication was being performed. The team also conducted walkdowns of the pump to assess the material condition and to verify the installed configuration was consistent with plant drawings and the design and licensing bases. Finally, the team reviewed corrective action documents,

system health reports, and work orders to determine if there were any adverse trends associated with the pump and to assess Constellation's problem identification, evaluation, and resolution of issues.

b. Findings

No findings were identified.

.2.1.16 Unit 2 Low Pressure Core Spray (LPCS) Pump, 2CSL*P1

a. Inspection Scope

The team inspected the Unit 2 low pressure core spray pump, 2CSL*P1, to verify that the pump was capable of performing its design basis function of providing adequate spray flow to the reactor core to remove the core's decay heat in response to a postulated LOCA condition. The team reviewed applicable portions of the UFSAR, TSs, calculations, and procedures to identify the pump design basis requirements. The team reviewed recent pump test results to verify that pump performance remained consistent with design basis requirements. The team reviewed calculations to ensure design requirements for flow and pressure were appropriately translated into acceptance criteria in pump IST procedures. The team verified that adequate NPSH for the LPCS pump was available for the worst case maximum flow conditions expected within the system for the existing power level and proposed EPU conditions.

The team reviewed completed surveillance tests for pump motor running current to determine whether results were consistent with specified test acceptance criteria. The completed modification to install additional vents on suction piping, and the planned modification to reduce drywell debris loading for the suction strainers were reviewed to ensure the changes met the design and performance requirements of the system. The team reviewed system operating procedures to verify consistency with pump design requirements and limitations. The team reviewed completed WOs to verify that required pump/motor lubrication was being performed. The team also conducted walkdowns of the pump to assess the material condition and to verify the installed configuration was consistent with plant drawings and the design and licensing bases. Finally, the team reviewed corrective action documents, system health reports, and WOs to determine if there were any adverse trends associated with the pump and to assess Constellation's problem identification, evaluation, and resolution of issues.

b. Findings

No findings were identified.

.2.1.17 Unit 2 Residual Heat Removal System Pump, 2RHS*P1A

a. Inspection Scope

The team inspected the Unit 2 RHR pump, 2RHS*P1A, to verify that the pump was capable of performing its design basis function of providing adequate cooling to restore and maintain level in the vessel following a postulated LOCA condition. The team reviewed applicable portions of the UFSAR, TSs, calculations, and procedures to identify the pump design basis requirements. The team reviewed recent pump test results to verify that pump performance remained consistent with design basis requirements. The team reviewed calculations to ensure design requirements for flow and pressure were appropriately translated into acceptance criteria in pump IST procedures. The team verified that adequate NPSH for the RHR pump was available for the worst case maximum flow conditions expected within the system.

The team reviewed completed surveillance tests for pump motor running current to determine whether the results were consistent with specified test acceptance criteria. The team reviewed system operating procedures to verify consistency with pump design requirements and limitations. The team reviewed completed WOs to verify that required pump/motor lubrication was being performed. The team also conducted walkdowns of the pump to assess the material condition and to verify the installed configuration was consistent with plant drawings and the design and licensing bases. Finally, the team reviewed corrective action documents, system health reports, and WOs to determine if there were any adverse trends associated with the pump and to assess Constellation's problem identification, evaluation, and resolution of issues.

b. Findings

No findings were identified.

.2.1.18 Unit 2 Reactor Core Isolation Cooling (RCIC) Pump Exhaust Vacuum Breaker Isolation Valve, 2ICS*MOV148

a. Inspection Scope

The team inspected the Unit 2 RCIC exhaust vacuum breaker isolation valve (2ICS*MOV 148) to verify its capability to perform its design basis function of closing on a system isolation signal. The team reviewed applicable portions of the UFSAR and TSs to identify the valve design basis requirements. The team reviewed calculations for valve stem thrust, MOV actuator inputs, and weak link analysis to ensure that the MOV was capable of operation under the worst-case line pressure and differential pressure conditions. Constellation's MOV program was reviewed to determine whether this valve had been adequately screened for its susceptibility to pressure locking.

The team reviewed surveillance procedures to verify design basis stroke times were enveloped by test acceptance criteria. The team reviewed vendor manuals to ensure recommended maintenance had been implemented through the preventive maintenance program. The team interviewed engineers to determine that surveillance test data was

appropriately trended and evaluated for indications of potential component degradation such as stem nut wear. Work orders were reviewed to verify that lubrication maintenance was being implemented in accordance with station procedures. The modification to incorporate a time delay in the closure circuit of the MOV was reviewed to ensure that the change met the design and performance requirements, as well as 10 CFR 50, Appendix J criteria. The team performed a walkdown of the valve and associated valve area to assess the material condition and operating environment of the valve. Finally, the team reviewed CRs to identify failures or adverse conditions to determine whether issues were being identified and properly addressed.

b. Findings

No findings were identified.

.2.1.19 Unit 2 Diesel Fire Water Cross-Tie Valve to Service Water Supply for the Division III High Pressure Core Spray (HPCS) Emergency Diesel Generator, 2SWP*V1230

a. Inspection Scope

The team inspected modification ECP-10-00291, which installed a cross-tie valve between the existing fire protection system and service water system in order to provide an additional source of cooling water to the Division III HPCS diesel generator. The cross-tie would be used in the event of an SBO, where service water systems would be unavailable to provide cooling to the Division III HPCS EDG, which would start on the loss of AC power. The team reviewed associated system operating procedure revisions, system calculations and post-installation test documents, and performed in-plant walk downs to verify operator actions could be successfully accomplished to align alternate cooling water to the Division III EDG within 15 minutes of an SBO. The review included an assessment of environmental conditions, operator accessibility to the area, adequacy of procedural guidance, operator training, and availability of support equipment and tools to ensure the cross-tie would be functional and provide adequate cooling to the Division III EDG.

b. Findings

No findings were identified.

.2.2 Review of Industry Operating Experience and Generic Issues (4 samples)

The team reviewed selected OE issues for applicability at Nine Mile Point Nuclear Power Station. The team performed a detailed review of the OE issues listed below to verify that Constellation had appropriately assessed potential applicability to site equipment and initiated corrective actions when necessary.

.2.2.1 NRC Information Notice (IN) 2010-03: Failures of Motor-Operated Valves Due to Degraded Stem Lubricant

a. Inspection Scope

The team performed a detailed review of Constellation's applicability review and disposition of NRC IN 2010-03 for NMP Units 1 and 2. The IN was issued to inform licensees of adverse consequences and industry experience associated with recent MOV failures due to degraded lubricant on the valve stem and actuator stem nut threaded area. The principle causes for the degraded lubricant condition were inadequate lubrication PM task frequencies and cross-contamination of the stem lubricant by the MOV actuator internal grease.

The team assessed the adequacy of Constellation's evaluation of IN 2010-03 by reviewing a sample of CRs, results of MOV periodic inspections for a sample of ten safety-related MOVs, diagnostic testing results, evaluations of lubricant material acceptability, and periodic MOV stem lubrication maintenance procedures, and by conducting interviews with engineering personnel. The team also assessed the adequacy of Constellation's initial assessment of CRs initiated during this inspection associated with this issue.

b. Findings

No findings were identified.

.2.2.2 NRC Information Notice 2007-34: Operating Experience Regarding Electrical Circuit Breakers

a. Inspection Scope

The team evaluated Constellation's applicability review and disposition of NRC IN 2007-34. The NRC issued this IN to inform licensees about OE regarding low, medium, and high voltage circuit breakers, including problems with deficient fit-up with cubicles, inadequate or excessive tolerances and gaps, worn or misadjusted operating linkages, inadequate or inappropriate maintenance practices, configuration control errors, deficiencies from original design and refurbishment, and design changes.

The team assessed the adequacy of Constellation's evaluation of the applicability of the IN to the Nine Mile Point Nuclear Station, including their review of station practices and procedures to ensure adequate retests were performed on circuit breakers after they were racked back into the switchgear following removal for maintenance. The inspection included a review of CRs, associated maintenance and operating procedures, and interviews with engineering personnel to verify that breaker configurations were consistent with the design and licensing bases.

b. Findings

No findings were identified.

.2.2.3 NRC Information Notice 2005-30: Safe Shutdown Potentially Challenged By Unanalyzed Internal Flooding Events and Inadequate Design

a. Inspection Scope

The team evaluated Constellation's applicability review and disposition of NRC IN 2005-30. The NRC issued the IN to alert licensees to the importance of establishing and maintaining the plant flooding analysis and design, consistent with NRC requirements and principles of effective risk management, to ensure that internal flooding risk was effectively managed.

The team reviewed Constellation's evaluation of their internal flooding analysis and design to ensure that safe shutdown would not be challenged by unanalyzed flooding events. The team reviewed maintenance procedures, operational procedures, and alarm response procedures to verify measures were adequate to protect safety-related components. The team conducted a walkdown of components analyzed and protective measures taken to ensure they would not be challenged by an internal flooding event from a non-safety system.

b. Findings

No findings were identified.

.2.2.4 NRC Information Notice 2010-26: Submerged Electrical Cables

a. Inspection Scope

The team performed a detailed review of Constellation's applicability review and disposition of NRC IN 2010-26 for NMP Units 1 and 2. The IN was issued to inform licensees of adverse consequences and industry experience associated with long-term submergence of electrical cables in water. Electrical cables at commercial nuclear power plants are not typically designed or qualified for submerged or moist environments. Industry response to NRC Generic Letter 2007-01, "Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients," indicated an increasing trend in underground cable failures. The predominant contributing factor was submergence or moisture intrusion. The increasing industry failure trend indicated a raised likelihood that a common-mode failure of accident mitigating system cables could occur.

The team reviewed station drawings, cable installation, maintenance history, maintenance rule program bases documents, corrective action program (CAP) documents, and test documents, interviewed engineering staff, and performed inspections of underground cables (accessible via man-holes MH-1 and MH-3) to determine whether Constellation had properly evaluated and addressed the cable submergence concerns discussed in the IN. The team also reviewed Constellation's corrective actions to address underground cable monitoring deficiencies previously documented in NRC non-cited violation 05000410/2009004-01, Unqualified HPCS Pump Power Cables Used in Submerged Conditions. The team discussed issues or concerns

identified during this inspection with station personnel to assess the adequacy of engineering's initial evaluation of the issue within the CAP.

b. Findings

No findings were identified.

## 4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems (IP 71152)

The team reviewed a sample of problems that Constellation had previously identified and entered into the CAP. The team reviewed these issues to verify an appropriate threshold for identifying issues and to evaluate the effectiveness of corrective actions. In addition, corrective action CRs written on issues identified during the inspection were reviewed to verify adequate problem identification and incorporation of the problem into the corrective action system. The specific corrective action documents that were sampled and reviewed by the team are listed in the Attachment.

b. Findings

No findings were identified.

4OA6 Meetings, including Exit

On August 5, 2011, the team presented the inspection results to Messrs. Sam Belcher and Thomas Lynch, and other members of NMPNS (Nine Mile Point Nuclear Station, LLC) management. The team reviewed proprietary information and returned the associated documents to Constellation at the end of the inspection. The team verified that no proprietary information is documented in the report.

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

NMPNS Personnel

S. Belcher, Site Vice President
P. Bartolini, Supervisor, Design Engineering
S. Dhar, Design Engineering
M. Eron, Supervisor, System Engineering
R. Glerum, System Engineer
B. Shanahan, Electrical Design Engineering
M. Shanbhag, Licensing Engineer
A. Sterio, Manager, Design Engineering

NRC Personnel

W. Schmidt, Senior Reactor Analyst
D. Dempsey, Resident Inspector
K. Kolaczyk, Senior Resident Inspector

### LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Open and Closed

None.

## LIST OF DOCUMENTS REVIEWED

Audits and Self-Assessments
SA-2011-000014, Focus Self Assessment, dated 1/28/11

Calculations
A10.1-AA-032, Assess Impact of Higher Debris Loads on the ECCS Suction Strainers, Rev. 0
A10.1-D-10, NPSH Available for SLC Pumps, Rev. 2
A10.1-D-11, Pressure Drop Calculation for SLS, Rev. 3
A10.1-D-008, Standby Liquid Control System Relief Valve Setpoint Determination, Rev. 1
A10.1-E-142, Residual Heat Removal System (RHS) Hydraulic Calculation, Rev. 1
A10.1-E-056, NPSH for 2RHS*P1A, B and C- Suction from Suppression Pool, Rev. 2
A10.1-F-034, Low Pressure Core Spray System Hydraulic Calculation, Rev. 0
A10.1-F-014, Available NPSH Calculation for LPCS Pump 2CSL*P1, Rev. 2
A10.1-H-047, Max Operating Conditions and Safety Functions for SR MOVs, Rev. 1
A10.1-H-059, MOV Sizing Calculation for GL 89-10 ICS System MOVs, Rev. 7
A10.1-N-420, HPCS Diesel Cooling Water Cross-Tie Steady State Hydraulic Analysis, Rev. 2
A10.1-N-131, Available Net Positive Suction Head for SWP*P1A-F, Rev. 1
A10.1-N-339, NMP2 Service Water System Proto-Flo Model, Rev. 0
A10.1-N-340, Proto-Flow SWP Base Hydraulic Model – Normal Operation, Rev. 1
A10.1-N-341, Three SWP Pumps – LOCA under Degraded Conditions, Rev. 0
ADC-11-000648-CN-001, Radiological Evaluation for RCIC Timing Modification ECP-10-000716, Rev. 0
CALC-09-000009, Required Submergence for the Unit 1 Emergency Service Water, Emergency Diesel Generator Jacket Water Cooling Pumps, Containment Spray Raw Water Pumps, and Diesel Fire Pump, Rev. 0
DC-064, Weak Link Calculation for Velan 1.5" Valve, Rev. C
EC-003, Auxiliary Power System Transformer Loading, Rev. 4
EC-032, Diesel Generator Loading, Rev. 13
EC-042, Verification of Adequacy of Div. I Battery and Chargers, Rev. 11
EC-129, Plant Emergency Battery Capability for SBO, Rev. 4
EDG-82-43/44, Determine EDG Storage Tank Unusable Volume, Rev. 2
EGF-12, NMP2 Division I, II, and III Standby Diesel Generator Day Tank Sizing, Rev. 3
EGF-16, NMP2 Division I, II Standby Diesel Generator Storage Tank, Rev. 3
ELMSAC-DEGVOLT-STUDY, Degraded Voltage Analysis for Unit 1, Rev. 0
General Electric DRF 0000-0070-3698, Project Task Force Report, Constellation Generation Group Nine Mile Point Nuclear Station Unit 2 Extended Power Uprate, Task T0505, Rev. 1
MOV-SP2-T/VD, Unit 1 Limitorque 600 VAC MOV Analysis, Rev. 4
NER-2M-007, Unit 2 Pressure Locking/Thermal Binding of Safety Related Power Operated Gate Valves, Rev. 3
NIMO-ELMS-AC-01, Performance of the Electrical Auxiliary System, Rev. 0
PH-158, RCIC Turbine Discharge Vacuum Breaker Time Delay Calculation, Rev. 0
S10-HVAC-HV08, Battery Room Low and High Temp HVAC Calculation, Rev. 2
S10-H2GAS-HV01, Hydrogen Gas Concentrations in Battery Rooms 11 and 12, Rev. 0
S13.1-100F005, Unit 1 Diesel Fire Pump / Reactor Vessel Flooding, Rev. 0
S13.4-70-F007, RBCLC System Thermal/Hydraulic Analysis, Rev. 0

S13.4-70-F002, IST Approved Pump Curves-Reactor Building Closed Loop Cooling Pumps, Rev. 3
S13.4-70-F004, RBCLC Pumps Reload Test Acceptance Criteria, Rev. 0
S14-81-F004, CS Pump NPSH Available vs. Required at Increased Post-Accident Torus Water Temperatures, Rev. 8
S14-81-F-010, IST Approved Pump Curves – Core Spray Pumps (CSP) and Core Spray Topping Pumps (CSTP), Rev. 0
S14-81-F035, Core Spray Design Basis Hydraulic Analysis, Rev. 0
S15-79-HTX04, Thermal Performance Evaluation for Unit 1 Emergency Diesel Generator (EDG) Jacket Water Coolers, Rev. 0
S15-82M001, Emergency Diesel Generator Fuel Oil Consumption, Rev. 2
S16.9-NPSHA-M002, Unit 1 Diesel Fire Pump NPSH Available, Rev. 0
S01-FLOOD-F001, Internal Flooding Hazard Analysis, Rev. 1
S20.1-01V010, MOV 01-01 Sizing, Rev. 4
S20.1-01V010-05-CN-014, Evaluation of Reduced Motor Voltage Resulting from Replacement of Magnesium Motor with Aluminum for IV-01-01, Rev. 0
S20.1-8910-MEDP, Unit 1 System Level and Max. Expected Differential Pressure Evaluations for GL 89-10 Program MOVs, Rev. 1
S20.1-80WL011, Weak Link Analysis for Valve FCV-80-118, Rev. 0
S20.1-80V118, MOV FCV-80-118 Sizing, Rev. 3
Shelf Life Engineering Evaluation Form S2268, Ensure Various Lubricant Products Meet EPRI Shelf Life Recommendation, Rev. 0
2-SQ-037, Max Thrust Load for Valves 2ICS8MOV148 and 164, Rev. 0
115KV-Relay-SP, 115 KV System Relay Settings, Rev. 1
125VDC-System-Case B, 125VDC System FSAR Case B Battery Sizing, Rev. 4
125VDCSYSTEMSBO, 125VDC System Station Blackout Battery Size, Rev. 5
125VDCBB11/BB12PDCS, Coordination Study for Battery Boards #11 & #12, Rev. 2
600VAC-PB17-PDCS, PB 17 Coordination Study, Rev. 0
600VAC-MCC167-80-118, MOV Motor Protection – OL Heater Sizing, Rev. 2
600VAC- S20.1-01WL010, MOV 01-01 and 01-02 Weak Link Analysis, Rev. 0
4.16KVACT101N/SLTCSP, RAT Tap Setting Analysis With Simplified ETAP Model, Rev. 3
4.16KVAC-PB102/103SETPT/27, Degraded Voltage Relay Setpoint, Rev. 2
4.16KVACDGES, Diesel Generator Loading, Rev. 7
4.160 VACPB102/103PDCS, Coordination and Protection Study for PB102 and 103 Update for Modification N1-02-029, Rev. 0
12177-CS-MSS*02, Main Steam Line Pipe Tunnel and Turbine Building High Ambient and Differential Temperature Alarm and Isolation, Rev. 6
12177-ES-203, Leak Detection System Process Safety Limit, Rev. 2

Corrective Action Condition Reports

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|---|---|---|---|
| 2005-003923 | 2007-007118 | 2009-000442 | 2009-003940 |
| 2005-004668 | 2008-004596 | 2009-000642 | 2009-004137 |
| 2006-003145 | 2008-007929 | 2009-000903 | 2009-005959 |
| 2007-000381 | 2008-008094 | 2009-001316 | 2010-001246 |
| 2007-002406 | 2008-008334 | 2009-001366 | 2010-009660 |
| 2007-002911 | 2008-008413 | 2009-003082 | 2010-010338 |

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|---|---|---|---|
| 2010-010819 | 2011-003278 | 2011-006829* | 2011-007013* |
| 2010-011569 | 2011-003648 | 2011-006839* | 2011-007019* |
| 2011-000448 | 2011-004105 | 2011-006843* | 2011-007021* |
| 2011-000474 | 2011-004171 | 2011-006847* | 2011-007034* |
| 2011-000534 | 2011-004240 | 2011-006848* | 2011-007064* |
| 2011-000651 | 2011-004797 | 2011-006849* | 2011-007065* |
| 2011-000723 | 2011-005596 | 2011-006892* | 2011-007067* |
| 2011-000779 | 2011-005959 | 2011-006959* | 2011-007068* |
| 2011-001025 | 2011-006421* | 2011-006976* | 2011-007075* |
| 2011-001770 | 2011-006489 | 2011-006981* | 2011-007076* |
| 2011-001773 | 2011-006593* | 2011-006987* | 2011-007095* |
| 2011-001803 | 2011-006802* | 2011-006995* | |
| 2011-002094 | 2011-006809* | 2011-006998* | |
| 2011-002122 | 2011-006814* | 2011-007011* | |

* CR written as a result of this inspection

Drawings

AE-100B, NMP Unit 2 DC Load List, Rev. 1
C-18021-C, Sheet 1, Turbine Building Heating, Cooling and Ventilating Systems P&ID, Rev. 28
C-18026-C, Unit 1 Emergency Diesel Generator 102 Starting Air, Cooling Water, Lube Oil and Fuel P&ID, Rev. 23
C-18026-C, Unit 1 Emergency Diesel Generator 103 Starting Air, Cooling Water, Lube Oil and Fuel P&ID, Rev. 24
C-18030-C, Fire Protection Water System P&ID, Rev. 37
C-18030-C, Fire Protection Foam & Spray Water P&ID, Rev. 15
C-19437-C, Elementary Wiring Diagram – 600 Volt Power Board 161B Power Circuits, Rev. 42
C-19440-C, Elementary Wiring Diagram – 600 Volt Power Board 171B Power Circuits, Rev. 41
C-19409-C, One Line Diagram – Auxiliary System (Power Boards), Rev. 10
C-19409-C, One Line Diagram – AC Station Power Distribution, Rev. 14
C-19409-C, One Line Diagram – Auxiliary System 4160 Volt Power Boards 11, 12 and 101, Rev. 32
C-19409-C, One Line Diagram – 4160 Volt Emergency System Power Boards 102 and 103, Rev. 26
C-19410-C, Elementary Wiring Diagram – 4.16KV Emergency Power Boards and Diesel Generators (#102 and #103 Control Circuits), Rev. 9
C-19839-C, One Line Diagram – 125V.D.C. Control Bus, Rev. 13
C-19839-C, One Line Diagram – 125V.D.C. Control Bus (Battery Board 12), Rev. 20
DEN-16334, Elevation 15HH-410EF-4 Stage Vertical Turbine 2500 GPM Fire Pump, Rev. B
DWG 21274, Worthington Curve for CS Pump 81-24, Rev. 0
DWG C-18002-C, Unit 1 Main Steam & High Press. Turbine P&ID, Rev. 45
DWG C-18006-C, Unit 1 Drywell and Torus Isolation Valves P&ID, Rev. 41
DWG C-18007-C, Unit 1 Reactor Core Spray P&ID, Rev. 58
DWG F-45550-C, 24-inch Globe Body MSIV Motor Operated (IV-01-01), Rev. 4
DWG PID-31B, Unit 2 Residual Heat Removal System, Rev. 19
DWG PID-31F, Unit 2 Residual Heat Removal System, Rev. 16
DWG PID-31G, Unit 2 Residual Heat Removal System, Rev. 15

DWG PID-32A, Unit 2 Low Pressure Core Spray, Rev. 18
DWG PID-35A, Unit 2 Reactor Core Isolation Cooling System, Rev. 16
DWG T-36828-2, Byron Jackson Test Curve for U2 LPCS Pump, Rev. 0
DWG T-36608-1, Byron Jackson Test Curve for U2 RHR Pump, Rev. 0
DWG X-10AFVS86X108-B, 10AFVS Pump (for RBCLC), Rev. 3
DWG X-10AFVS8GX-108B, RBCLC Pump Cross Section, Rev. 0
DWG18022-C, Unit 1 Reactor Bldg Closed Loop Cooling System P&ID, Rev. 54
EE-32F, Manhole & Ductline Sections and Details
EE-1AR, 600 Volt One Line Diagram, Rev. 19
EE-1Q, 4160V One Line Diagram, 2ENS*SWG101 Emergency Bus, Rev. 16
EE-M01F, Plant Master One Line Diagram, Emergency and Normal 125 V and 24/48VDC, Rev.8
ESK-7CPS03, AC Elementary Diagram Primary Containment Purge Miscellaneous AC Circuits, Rev. 10
ESK-6SLS01, AC Elementary Diagram 600V MCC Circuits Standby Liquid Control Pump 1A, Rev. 15
PID-105, Piping and Instrumentation Diagram, Nitrogen System, Rev. 19
PID-11A, Piping and Instrumentation Diagram, Service Water System, Rev.18
PID-11L, Piping and Instrument Diagram, Service Water System, Rev. 23
PID-43B, Piping and Instrument Diagram, Fire Protection Water, Rev. 24
PID-43F, Piping and Instrument Diagram, Fire Protection Water, Rev. 18
PID-61A-13, Piping and Instrumentation Diagram, Primary Containment Purge and Standby Gas Treatment, Rev. 13
PID-36A, Piping and Instrumentation Diagram, Standby Liquid Control, Rev. 25
PID-55B, Piping and Instrumentation Diagram, Turbine Building Ventilation, Rev. 16
PID-57A-8, Piping and Instrumentation Diagram, Diesel Generator Building Ventilation, Rev. 8
PID-104A-21, Piping and Instrumentation Diagram, Standby Diesel Generator System, Rev. 21
PID-104C-9, Piping and Instrumentation Diagram, Standby Diesel Generator System, Rev. 9
TL2MSS-189, Test Loop Diagram, Steam Lead Enclosure Temperature 2MMSS*TE50A Rev. 2
TL2MSS-104, Test Loop Diagram, Steam Lead Enclosure Temperature 2MMSS*TE69A Rev. 3
12177-BZ-494ZQ-1, Pipe Support Detail, Turbine Building (thermocouple mounting), Rev. 1
12177-BZ-494ZR-1, Pipe Support Detail, Turbine Building (thermocouple mounting), Rev. 1
12177-BZ-494ZS-1, Pipe Support Detail, Turbine Building (thermocouple mounting), Rev. 1
12177-BZ-494ZT-1, Pipe Support Detail, Turbine Building (thermocouple mounting), Rev. 1
12177-BZ-494ZU-1, Pipe Support Detail, Turbine Building (thermocouple mounting), Rev. 1
12177-BZ-494ZV-1, Pipe Support Detail, Turbine Building (thermocouple mounting), Rev. 1
12177-EB-25N-3, Ventilation Sections Main Steam Tunnel Turbine Building, Rev. 6

<u>Functional, Surveillance and Modification Acceptance Testing</u>
N1-CTP-Q550 Attachment 1, 102 and 103 Diesel Cooling Water Data Sheet, performed 2/10/11, 4/8/11, and 4/23/11
N1-EPM-DGE-252, Emergency Diesel Generator Inspection (DG102 and DG103), performed 11/18/09
N1-EPM-SB-266, Battery Intercell Connector Inspection, performed 4/2/11
N1-EPM-SB-269, Battery Equalizing Charge, performed 4/7/11
N1-EPM-SB-272, 125VDC Station Battery Capacity Discharge Test, performed 4/7/11
N1-ESP-SB-275, 125 VDC Battery Cell Surveillance, performed 4/7/11 and 6/22/11

N1-MMP-079-412, Diesel Generator Cooling Water Heat Exchanger and Temperature Control Valve Maintenance, performed 11/17/09
N1-MPM-GEN-852, Emergency Diesel Generator Engine and Associated Equipment Inspection (ENG-DG 102 and ENG-DG 103), performed 11/18/09
N1-PM-C3, Electric and Diesel Fire Pump Performance Tests, performed 9/18/09 and 9/1/10
N1-PM-M9, Unit 1 Monthly Operation of Fire Pumps, performed 6/11/11, 6/24/11, and 7/9/11
N1-PM-S1, Operator Rounds Guide, performed 6/30/11
N1-ST-05, Primary Containment Isolation Valves Operability Test, performed 2/10/11
N1-ST-22, Unit 1 Diesel Fire Pump Instrument Air Test and Flow Verification, performed 4/29/11
N1-ST-M4A, Emergency Diesel Generator 102 and PB102 Operability Test, performed 4/21/11 and 6/27/2011
N1-ST-V8, MS FW/HPCI, SCD, EC, Rx Head Vent Valve Cold S/D Operability Test, performed 4/17/11
N1-ST-Q14, RBCLC System Pump Operability Test, performed 2/16/2011 and 6/2/2011
N1-ST-V7, RBCLC System Pump Operability Test, performed 3/24/11
N1-ST-Q1C, CS 112 Pump and Valve Operability Test, performed 6/14/2011
N1-ST-Q16A, Emergency Diesel Generator 102 Quarterly Test, performed 1/24/11
N1-ST-Q25, Emergency Diesel Generator Cooling Water Quarterly Test, performed 5/8/2011, 6/15/2011, and 7/1/2011
N1-ST-R2, LOCA and EDG Simulated Auto Initiation Test, performed 3/22/11
N2-ESP-BYS-Q676, Quarterly Battery Surveillance Test, performed 5/18/11
N2-ESP-BYS-R682, Division I/II/III Battery Charger Load Test, 2BYS*CHGR2C1,performed 10/28/10
N2-ESP-BYS-R685, Division I Battery Modified Profile Test, performed 4/22/10
N2-ESP-BYS-W675, 125Vdc Weekly Battery Surveillance Test, performed 6/13/11, 6/20/11 and 7/25/11
N2-ISP-CPS-Q002, Drywell and Suppression Chamber Purge System Exhaust Isolation Valve Leakage Test, performed 3/17/11
N2-ISP-LDS-Q006, Main Steam Line Tunnel and MSL Lead Enclosure Temperature Instrument Channel Functional Test, performed 5/31/11
N2-ISP-LDS-R106, Main Steam Line Tunnel and MSL Lead Enclosure Temperature Instrument Channel Calibration, performed 1/4/10 and 1/27/10
N2-MSP-EGS-R001, Diesel Generator Inspection Division I and II, performed 4/17/10
N2-MSP-EGS-6Y001, Diesel Generator 6 Year Inspection Division I and II, performed 4/17/10
N2-OSP-CSL-Q002, LPCS Pump and Valve Operability and System Integrity Test, performed 3/18/11 and 6/23/2011
N2-OSP-EGS-R002, Operating Cycle Diesel Generator 24 Hour Run and Load Rejection Division I and II, performed 5/19/10
N2-OSP-EGS-R003, Diesel Generator Loss of Offsite Power with no ECCS, Division I and II, performed 4/17/10
N2-OSP-RHS-Q004, RHR System Loop A Pump and Valve Operability Test and System Integrity Test and ASME XI Pressure Test, performed 4/22/11
N2-OSP-CPS-Q001, Primary Containment Purge System Valve Operability Test, performed 6/13/2011
N2-OSP-EGS-M001, Diesel Generator and Diesel Air Start Valve Operability Test – Division I and II, performed 6/20/11

N2-OSP-LOG-S001, Attachment 3, Temperature Logs (MSL tunnel temperature), performed 7/18/11 through 7/23/11
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## LIST OF ACRONYMS

| | |
|---|---|
| AC | Alternating Current |
| ADAMS | Agencywide Documents Access and Management System |
| AOV | Air Operated Valve |
| ATWS | Anticipated Transient without Scram |
| CAP | Corrective Action Program |
| CDBI | Component Design Bases Inspection |
| CFR | Code of Federal Regulations |
| CR | Condition Report |
| DC | Direct Current |
| DRS | Division of Reactor Safety |
| ECCS | Emergency Core Cooling System |
| EDG | Emergency Diesel Generator |
| EOP | Emergency Operating Procedure |
| EPU | Extended Power Uprate |
| GL | Generic Letter |
| HPCS | High Pressure Core Spray |
| IN | Information Notice |
| IP | Inspection Procedure |
| ISI | In-Service Inspection |
| IST | In-Service Test |
| KV | Kilo-Volts |
| LERF | Large Early Release Frequency |
| LOCA | Loss-of-Coolant Accident |
| LOOP | Loss-of-Offsite Power |
| LPCS | Low Pressure Core Spray |
| MCC | Motor Control Center |
| MOV | Motor Operated Valve |
| MSIV | Main Steam Isolation Valves |
| NMP | Nine Mile Point |
| NPSH | Net Positive Suction Head |
| NRC | Nuclear Regulatory Commission |
| OE | Operating Experience |
| P&ID | Piping and Instrumentation Diagram |
| PM | Preventive Maintenance |
| PRA | Probabilistic Risk Assessment |
| RAW | Risk Achievement Worth |
| RBCLC | Reactor Building Closed Loop Cooling |
| RCIC | Reactor Core Isolation Cooling |
| RHR | Residual Heat Removal |
| RRW | Risk Reduction Worth |
| SBO | Station Blackout |
| SLCS | Standby Liquid Control System |
| SPAR | Standardized Plant Analysis Risk |
| SW | Service Water |
| TS | Technical Specifications |
| UFSAR | Updated Final Safety Analysis Report |

| | |
|---|---|
| VAC | Volts, Alternating Current |
| VDC | Volts, Direct Current |
| WO | Work Order |